

wood or ivory. The best method is to employ diamond powder. Take a little of the powder, make into a paste with fine oil, on the end of a copper polisher the surface of which has been freshly filed and slightly rounded. The marks will rapidly disappear when rubbed with this. The surface is left a little dull; it may be rendered bright by rubbing with the same powder mixed with a greater quantity of oil, and applied with a stick of pegwood. Watchmakers will do well to try on disused dials several degrees of fineness of the diamond powder.

Cleaning Pearls.—Pearls turn yellow in the course of time by absorbing perspiration on account of being worn in the hair, at the throat, and on the arms. There are several ways of rendering them white again.

I.—The best process is said to be to put the pearls into a bag with wheat bran and to heat the bag over a coal fire, with constant motion.

II.—Another method is to bring 8 parts each of well-calcined, finely powdered lime and wood charcoal, which has been strained through a gauze sieve, to a boil with 500 parts of pure rain water, suspend the pearls over the steam of the boiling water until they are warmed through, and then boil them in the liquid for 5 minutes, turning frequently. Let them cool in the liquid, take them out, and wash off well with clean water.

III.—Place the pearls in a piece of fine linen, throw salt on them, and tie them up. Next rinse the tied-up pearls in lukewarm water until all the salt has been extracted, and dry them at an ordinary temperature.

IV.—The pearls may also be boiled about $\frac{1}{2}$ hour in cow's milk into which a little cheese or soap has been scraped; take them out, rinse off in fresh water, and dry them with a clean, white cloth.

V.—Another method is to have the pearls, strung on a silk thread or wrapped up in thin gauze, mixed in a loaf of bread of barley flour and to have the loaf baked well in an oven, but not too brown. When cool remove the pearls.

VI.—Hang the pearls for a couple of minutes in hot, strong, wine vinegar or highly diluted sulphuric acid, remove, and rinse them in water. Do not leave them too long in the acid, otherwise they will be injured by it.

GLASS CLEANING:

Cleaning Preparation for Glass with Metal Decorations.—Mix 1,000 parts of denaturized spirit (96 per cent) with 150

parts, by weight, of ammonia; 20 parts of acetic ether; 15 parts of ethylic ether; 200 parts of Vienna lime; 950 parts of bolus; and 550 parts of oleine. With this mixture both glass and metal can be quickly and thoroughly cleaned. It is particularly recommended for show windows ornamented with metal.

Paste for Cleaning Glass.—

Prepared chalk.....	6 pounds
Powdered French chalk.....	1½ pounds
Phosphate calcium...	2½ pounds
Quillaia bark.....	2½ pounds
Carbonate ammonia..	18 ounces
Rose pink.....	6 ounces

Mix the ingredients, in fine powder, and sift through muslin. Then mix with soft water to the consistency of cream, and apply to the glass by means of a soft rag or sponge; allow it to dry on, wipe off with a cloth, and polish with chamois.

Cleaning Optical Lenses.—For this purpose a German contemporary recommends vegetable pith. The medulla of rushes, elders, or sunflowers is cut out, the pieces are dried and pasted singly alongside of one another upon a piece of cork, whereby a brush-like apparatus is obtained, which is passed over the surface of the lens. For very small lenses pointed pieces of elder pith are employed. To dip dirty and greasy lenses into oil of turpentine or ether and rub them with a linen rag, as has been proposed, seems hazardous, because the Canada balsam with which the lenses are cemented might dissolve.

To Remove Glue from Glass.—If glue has simply dried upon the glass hot water ought to remove it. If, however, the spots are due to size (the gelatinous wash used by painters) when dried they become very refractory and recourse must be had to chemical means for their removal. The commonest size being a solution of gelatin, alum, and rosin dissolved in a solution of soda and combined with starch, hot solutions of caustic soda or of potash may be used. If that fails to remove them, try diluted hydrochloric, sulphuric, or any of the stronger acids. If the spots still remain some abrasive powder (flour of emery) must be used and the glass repolished with jewelers' rouge applied by means of a chamois skin. Owing to the varied nature of sizes used the above are only suggestions.

Cleaning Window Panes.—Take diluted nitric acid about as strong as strong

vinegar and pass it over the glass pane, leave it to act a minute and throw on pulverized whiting, but just enough to give off a hissing sound. Now rub both with the hand over the whole pane and polish with a dry rag. Rinse off with clean water and a little alcohol and polish dry and clear. Repeat the process on the other side. The nitric acid removes all impurities which have remained on the glass at the factory, and even with inferior panes a good appearance is obtained.

To Clean Store Windows.—For cleaning the large panes of glass of store windows, and also ordinary show cases, a semiliquid paste may be employed, made of calcined magnesia and purified benzine. The glass should be rubbed with a cotton rag until it is brilliant.

Cleaning Lamp Globes.—Pour 2 spoonfuls of a slightly heated solution of potash into the globe, moisten the whole surface with it, and rub the stains with a fine linen rag; rinse the globe with clean water and carefully dry it with a fine, soft cloth.

To Clean Mirrors.—Rub the mirror with a ball of soft paper slightly dampened with methylated spirits, then with a duster on which a little whiting has been sprinkled, and finally polish with clean paper or a wash leather. This treatment will make the glass beautifully bright.

To Clean Milk Glass.—To remove oil spots from milk glass panes and lamp globes, knead burnt magnesia with benzine to a plastic mass, which must be kept in a tight-closing bottle. A little of this substance rubbed on the spot with a linen rag will make it disappear.

To Remove Oil-Paint Spots from Glass.—If the window panes have been bespattered with oil paint in painting walls, the spots are, of course, easily removed while wet. When they have become dry the operation is more difficult and alcohol and turpentine in equal parts, or spirit of sal ammoniac should be used to soften the paint. After that go over it with chalk. Polishing with salt will also remove paint spots. The salt grates somewhat, but it is not hard enough to cause scratches in the glass; a subsequent polishing with chalk is also advisable, as the drying of the salt might injure the glass. For scratching off soft paint spots sheet zinc must be used, as it cannot damage the glass on account of its softness. In the case of silicate paints (the so-called weather-proof coatings) the

panes must be especially protected, because these paints destroy the polish of the glass. Rubbing the spots with brown soap is also a good way of removing the spots, but care must be taken in rinsing off that the window frames are not acted upon.

Removing Silver Stains.—The following solution will remove silver stains from the hands, and also from woolen, linen, or cotton goods:

Mercuric chloride....	1 part
Ammonia muriate....	1 part
Water.....	8 parts

The compound is poisonous.

MISCELLANEOUS CLEANING METHODS AND PROCESSES:

Universal Cleaner.—

Green soap.....	20 to 25 parts
Boiling water.....	750 parts
Liquid ammonia,	
caustic.....	30 to 40 parts
Acetic ether.....	20 to 30 parts

Mix.

To Clean Playing Cards.—Slightly soiled playing cards may be made clean by rubbing them with a soft rag dipped in a solution of camphor. Very little of the latter is necessary.

To Remove Vegetable Growth from Buildings.—To remove moss and lichen from stone and masonry, apply water in which 1 per cent of carbolic acid has been dissolved. After a few hours the plants can be washed off with water.

Solid Cleansing Compound.—The basis of most of the solid grease eradicators is benzine and the simplest form is a benzine jelly made by shaking 3 ounces of tincture of quillaia (soap bark) with enough benzine to make 16 fluidounces. Benzine may also be solidified by the use of a soap with addition of an excess of alkali. Formulas in which soaps are used in this way follow:

I.—Cocanut-oil soap.	2 av. ounces
Ammonia water....	3 fluidounces
Solution of potassium.....	1½ fluidounces
Water enough to make.....	12 fluidounces

Dissolve the soap with the aid of heat in 4 fluidounces of water, add the ammonia and potassa and the remainder of the water.

If the benzine is added in small portions, and thoroughly agitated, 2½ fluidounces of the above will be found sufficient to solidify 32 fluidounces of benzine.

- II.—Castile soap, white. $3\frac{1}{2}$ av. ounces
 Water, boiling. . . . $3\frac{1}{2}$ fluidounces
 Water of ammonia 5 fluidrachms
 Benzine enough to
 make. 16 fluidounces

Dissolve the soap in the water, and when cold, add the other ingredients.

To Clean Oily Bottles.—Use 2 heaped tablespoonfuls (for every quart of capacity) of fine sawdust or wheat bran, and shake well to cover the interior surface thoroughly; let stand a few minutes and then add about a gill of cold water. If the bottle be then rotated in a horizontal position, it will usually be found clean after a single treatment. In the case of drying oils, especially when old, the bottles should be moistened inside with a little ether, and left standing a few hours before the introduction of sawdust. This method is claimed to be more rapid and convenient than the customary one of using strips of paper, soap solution, etc.

Cork Cleaner.—Wash in 10 per cent solution of hydrochloric acid, then immerse in a solution of sodium hyposulphite and hydrochloric acid. Finally the corks are washed with a solution of soda and pure water. Corks containing oil or fat cannot be cleaned by this method.

To Clean Sponges.—Rinse well first in very weak, warm, caustic-soda lye, then with clean water, and finally leave the sponges in a solution of bromine in water until clean. They will whiten sooner if exposed to the sun in the bromine water. Then repeat the rinsings in weak lye and clean water, using the latter till all smell of bromine has disappeared. Dry quickly and in the sun if possible.

To Clean Leather Chairs.—Thoroughly beat the whites of three eggs, then with a piece of soft flannel cloth rub the beaten whites into the leather of the chair seat. The leather will soon be clean and will shine as if new. Lamp black may be added if the leather is black.

To Clean or Flush Toilets.—Mix together 1 pound common washing soda in powdered form with 3 ounces of caustic soda. This can be sprinkled in the bowl of the toilet, letting it remain in it for several hours. A little water to moisten the same should be used.

To Clean Waste Pipes.—Simple, inexpensive method of clearing the pipe is as follows: Just before retiring at night pour into the pipe enough *liquid* potash (not soda) lye of 36° strength to fill the "trap," as it is called, or bent portion of the pipe just below the outlet. About a pint will suffice for a washstand, or a quart for a bath-tub or kitchen sink. Be sure that no water runs into it till next morning. During the night the lye will change all of the offal in the pipe into *soft soap*, and the first current of water in the morning will remove it entirely, and leave the pipe as clean as new. Two applications of the lye should be enough to cure any case. The so-called potash lye sold in small tin cans in the shops is not recommended for this purpose; it is quite commonly misnamed, and is called *caustic soda*, which makes a hard soap. That may block up the pipe even worse than the material it was desired to remove.

To Clean Windshields.—Use equal parts of denatured alcohol and ether. Apply this mixture to the glass with a clean woolen cloth. Rub briskly, then sprinkle a little of jeweler's rouge upon a piece of chamoise skin and polish. The result will be that the glass will shine like crystal.

COFFEE, SUBSTITUTES FOR.

I.—Acorn.—From acorns deprived of their shells, husked, dried, and roasted.

II.—Bean.—Horse beans roasted along with a little honey or sugar.

III.—Beet Root.—From the yellow beet root, sliced, dried in a kiln or oven, and ground with a little coffee.

IV.—Dandelion.—From dandelion roots, sliced, dried, roasted, and ground with a little caramel.

All the above are roasted, before grinding them, with a little fat or lard. Those which are larger than coffee berries are cut into small slices before being roasted. They possess none of the exhilarating properties or medicinal virtues of the genuine coffee.

V.—Chicory.—This is a common adulterant. The roasted root is prepared by cutting the full-grown root into slices, and exposing it to heat in iron cylinders, along with about $1\frac{1}{2}$ per cent or 2 per cent of lard, in a similar way to that adopted for coffee. When ground to powder in a mill it constitutes the chi-

cory coffee so generally employed both as a substitute for coffee and as an adulterant. The addition of 1 part of good, fresh, roasted chicory to 10 or 12 parts of coffee forms a mixture which yields a beverage of a fuller flavor, and of a deeper color than that furnished by an equal quantity of pure or unmixed coffee. In this way a less quantity of coffee may be used, but it should be remembered that the article substituted for it does not possess in any degree the peculiar exciting, soothing, and hunger-staying properties of that valuable product. The use, however, of a larger proportion of chicory than that just named imparts to the beverage an insipid flavor, intermediate between that of treacle and licorice; while the continual use of roasted chicory, or highly chloricized coffee, seldom fails to weaken the powers of digestion and derange the bowels.

COFFEE CORDIAL:

See Wines and Liquors.

COFFEE EXTRACTS:

See Essences and Extracts.

COFFEE SYRUPS:

See Syrups.

COFFEE FOR THE SODA FOUNTAIN:

See Beverages.

COIL SPRING:

See Steel.

COIN CLEANING:

See Cleaning Preparations and Methods.

COINS, IMPRESSIONS OF:

See Matrix Mass.

COIN METAL:

See Alloys.

COLAS:

See Veterinary Formulas.

Cold and Cough Mixtures

Cough Syrup.—The simplest form of cough syrup of good keeping quality is syrup of wild cherry containing ammonium chloride in the dose of 2½ grains to each teaspoonful. Most of the other compounds contain ingredients that are prone to undergo fermentation.

I.—Ipecacuanha wine	1 fluidounce
Spirit of anise. . . .	1 fluidrachm
Syrup.	16 fluidounces

Syrup of squill. . . .	8 fluidounces
Tincture of Tolu. . .	4 fluidrachms
Distilled water enough to make	30 fluidounces

II.—Heroin.	6 grains
Aromatic sulphuric acid	1½ fluidounces
Concentrated acid infusion of roses	4 fluidounces
Distilled water. . . .	5 fluidounces
Glycerine.	5 fluidounces
Oxymel of squill. . .	10 fluidounces

III.—Glycerine.	2 fluidounces
Fluid extract of wild cherry. . . .	4 fluidounces
Oxymel.	10 fluidounces
Syrup.	10 fluidounces
Cochineal, a sufficient quantity.	

Benzoic-Acid Pastilles.—

Benzoic acid	105 parts
Rhatany extract	525 parts
Tragacanth.	35 parts
Sugar.	140 parts

The materials, in the shape of powders, are mixed well and sufficient fruit paste added to bring the mass up to 4,500 parts. Roll out and divide into lozenges weighing 20 grains each.

Cough Balsam with Iceland Moss.—

Solution of morphine acetate.	12 parts
Sulphuric acid, dilute	12 parts
Cherry-laurel water.	12 parts
Orange-flower water, triple.	24 parts
Syrup, simple.	128 parts
Glycerine.	48 parts
Tincture of saffron. .	8 parts
Decoction of Iceland moss.	112 parts

Mix. Dose: One teaspoonful.

Balsamic Cough Syrup.—

Balsam of Peru.	2 drachms
Tincture of Tolu. . . .	4 drachms
Camphorated tincture of opium	4 ounces
Powdered extract licorice.	1 ounce
Syrup squill.	4 ounces
Syrup dextrine (glucose) sufficient to make.	16 ounces

Add the balsam of Peru to the tinctures, and in a mortar rub up the extract of licorice with the syrups. Mix together and direct to be taken in teaspoonful doses.

Whooping-Cough Remedies.—The following mixture is a spray to be used

212 COLD AND COUGH MIXTURES—CONDIMENTS

in the sick room in cases of whooping cough:

Thymol.....	1.0
Tincture of eucalyptus..	30.0
Tincture of benzoïn....	30.0
Alcohol.....	100.0
Water enough to make	1000.0

Mix. Pour some of the mixture on a cloth and hold to mouth so that the mixture is inhaled, thereby giving relief.

Expectorant Mixtures.—

I.—Ammon. chloride.	1 drachm
Potass. chlorate..	30 grains
Paregoric	2 fluidrachms
Syrup of ipecac...	2 fluidrachms
Syrup wild cherry enough to make	2 fluidounces

Dose: One teaspoonful.

II.—Potass. chlorate..	1 drachm
Tincture guaiac ..	3½ drachms
Tincture rhubarb.	1½ drachms
Syrup wild cherry enough to make	3 fluidounces

Dose: One teaspoonful.

Eucalyptus Bonbons for Coughs.—

Eucalyptus oil.....	5 parts
Tartaric acid.....	15 parts
Extract of malt....	24 parts
Cacao.....	100 parts
Peppermint oil....	1.4 parts
Bonbon mass.....	2,203 parts

Mix and make into bonbons weighing 30 grains each.

COLD CREAM:

See Cosmetics.

COLIC IN CATTLE:

See Veterinary Formulas.

COLLODION.

Turpentine.....	5 parts
Ether and alcohol....	10 parts
Collodion.....	94 parts
Castor oil.....	1 part

Dissolve the turpentine in the ether and alcohol mixture (in equal parts) and filter, then add to the mixture of collodion and castor oil. This makes a good elastic collodion.

See also Court Plaster, Liquid.

COLOGNE:

See Perfumes.

COLOGNE FOR HEADACHES:

See Headaches.

COLORS:

See Dyes and Pigments.

COLORS, FUSIBLE ENAMEL:

See Enameling.

COLORS TO SET IN FABRICS:

The colors of fabrics or other materials of any kind may be set by boiling the article in the following solution: To 1 gallon of soft water add 1 ounce of ox gall. This solution should be boiling when the articles are dropped into it. A chemical reaction results and the colors are set or made nonfading. The process is harmless. Colors in wool may be treated in the same manner.

Condiments

Chowchow.—

Curry powder.....	4 ounces
Mustard powder.....	6 ounces
Ginger.....	3 ounces
Turmeric.....	2 ounces
Cayenne.....	2 drachms
Black pepper powder.	2 drachms
Coriander.....	1 drachm
Allspice.....	1 drachm
Mace.....	30 grains
Thyme.....	30 grains
Savory.....	30 grains
Celery seed.....	2 drachms
Cider vinegar.....	2 gallons

Mix all the powders with the vinegar, and steep the mixture over a very gentle fire for 3 hours. The pickles are to be parboiled with salt, and drained, and the spiced vinegar, prepared as above, is to be poured over them while it is still warm. The chowchow keeps best in small jars, tightly covered.

Essence of Extract of Soup Herbs.—

Thyme, 4 ounces; winter savory, 4 ounces; sweet marjoram, 4 ounces; sweet basil, 4 ounces; grated lemon peel, 1 ounce; eschalots, 2 ounces; bruised celery seed, 1 ounce; alcohol (50 per cent), 64 ounces. Mix the vegetables, properly bruised, add the alcohol, close the container and set aside in a moderately warm place to digest for 15 days. Filter and press out. Preserve in 4-ounce bottles, well corked.

Tomato Bouillon Extract.—Tomatoes, 1 quart; arrowroot, 2 ounces; extract of beef, 1 ounce; bay leaves, 1 ounce; cloves, 2 ounces; red pepper, 4 drachms; Worcestershire sauce, quantity sufficient to flavor. Mix.

Mock Turtle Extract.—Extract of beef, 2 ounces; concentrated chicken, 2 ounces; clam juice, 8 ounces; tincture of black pepper, 1 ounce; extract of celery, 3 drachms; extract of orange peel, soluble, 1 drachm; hot water enough to make 2 quarts.

RELISHES:

Digestive Relish.—

I.—Two ounces Jamaica ginger; 2 ounces black peppercorns; 1 ounce mustard seed; 1 ounce coriander fruit (seed); 1 ounce pimento (allspice); $\frac{1}{2}$ ounce mace; $\frac{1}{2}$ ounce cloves; $\frac{1}{2}$ ounce nutmegs; $\frac{1}{2}$ ounce chili pods; 3 drachms cardamom seeds; 4 ounces garlic; 4 ounces eschalots; 4 pints malt vinegar.

Bruise spices, garlic, etc., and boil in vinegar for 15 minutes and strain. To this add $2\frac{1}{2}$ pints mushroom ketchup; $1\frac{1}{2}$ pints India soy.

Again simmer for 15 minutes and strain through muslin.

II.—One pound soy; 50 ounces best vinegar; 4 ounces ketchup; 4 ounces garlic; 4 ounces eschalots; 4 ounces capsicum; $\frac{1}{2}$ ounce cloves; $\frac{1}{2}$ ounce mace; $\frac{1}{4}$ ounce cinnamon; 1 drachm cardamom seeds. Boil well and strain.

Lincolnshire Relish.—Two ounces garlic; 2 ounces Jamaica ginger; 3 ounces black peppercorns; $\frac{3}{4}$ ounce cayenne pepper; $\frac{1}{4}$ ounce ossein; $\frac{3}{4}$ ounce nutmeg; 2 ounces salt; $1\frac{1}{2}$ pints India soy. Enough malt vinegar to make 1 gallon. Bruise spices, garlic, etc., and simmer in $\frac{1}{2}$ a gallon of vinegar for 20 minutes, strain and add soy and sufficient vinegar to make 1 gallon, then boil for 5 minutes. Keep in bulk as long as possible.

Curry Powder.—

I.—Coriander seed..... 6 drachms
Turmeric..... 5 scruples
Fresh ginger..... $4\frac{1}{2}$ drachms
Cumin seed..... 18 grains
Black pepper..... 54 grains
Poppy seed..... 94 grains
Garlic..... 2 heads
Cinnamon..... 1 scruple
Cardamom..... 5 seeds
Cloves..... 8 only
Chillies..... 1 or 2 pods
Grated cocoanut.... $\frac{1}{2}$ nut

II.—Coriander seed..... $\frac{1}{2}$ pound
Turmeric..... $\frac{1}{4}$ pound
Cinnamon seed..... 2 ounces
Cayenne..... $\frac{1}{2}$ ounce
Mustard..... 1 ounce
Ground ginger..... 1 ounce
Allspice..... $\frac{1}{2}$ ounce
Fenugreek seed..... 2 ounces

TABLE SAUCES:

Worcestershire Sauce.—

Pimento..... 2 drachms
Clove..... 1 drachm
Black pepper..... 1 drachm
Ginger..... 1 drachm
Curry powder..... 1 ounce

Capsicum..... 1 drachm
Mustard..... 2 ounces
Shallots, bruised..... 2 ounces
Salt..... 2 ounces
Brown sugar..... 8 ounces
Tamarinds..... 4 ounces
Sherry wine..... 1 pint
Wine vinegar..... 2 pints

The spices must be freshly bruised. The ingredients are to simmer together with the vinegar for an hour, adding more of the vinegar as it is lost by evaporation; then add the wine, and if desired some caramel coloring. Set aside for a week, strain, and bottle.

Table Sauce.—Brown sugar, 16 parts; tamarinds, 16 parts; onions, 4 parts; powdered ginger, 4 parts; salt, 4 parts; garlic, 2 parts; cayenne, 2 parts; soy, 2 parts; ripe apples, 64 parts; mustard powder, 2 parts; curry powder, 1 part; vinegar, quantity sufficient. Pare and core the apples, boil them in sufficient vinegar with the tamarinds and raisins until soft, then pulp through a fine sieve. Pound the onions and garlic in a mortar and add the pulp to that of the apples. Then add the other ingredients and vinegar, 60 parts; heat to boiling, cool, and add sherry wine, 10 parts, and enough vinegar to make the sauce just pourable. If a sweet sauce is desired add sufficient treacle before the final boiling.

Epicure's Sauce.—Eight ounces tamarinds; 12 ounces sultana raisins; 2 ounces garlic; 4 ounces eschalots; 4 ounces horse-radish root; 2 ounces black pepper; $\frac{1}{2}$ ounce chili pods; 3 ounces raw Jamaica ginger; $1\frac{1}{2}$ pounds golden syrup; 1 pound burnt sugar (caramel); 1 ounce powdered cloves; 1 pint India soy; 1 gallon malt vinegar. Bruise roots, spices, etc., and boil in vinegar for 15 minutes, then strain. To the strained liquor add golden syrup, soy, and burnt sugar, then simmer for 10 minutes.

Piccalilli Sauce.—One drachm chili pods; $1\frac{1}{2}$ ounces black peppercorns; $\frac{1}{2}$ ounce pimento; $\frac{1}{4}$ ounce garlic; $\frac{1}{2}$ gallon malt vinegar. Bruise spices and garlic, boil in the vinegar for 10 minutes, and strain.

One ounce ground Jamaica ginger; 1 ounce turmeric; 2 ounces flower of mustard; 2 ounces powdered natal arrowroot; 8 ounces strong acetic acid. Rub powders in a mortar with acetic acid and add to above, then boil for 5 minutes, or until it thickens.

FLAVORING SPICES.

I.—Five ounces powdered cinnamon bark; $2\frac{1}{2}$ ounces powdered cloves; $2\frac{1}{2}$

ounces powdered nutmegs; $1\frac{1}{4}$ ounces powdered caraway seeds; $1\frac{1}{4}$ ounces powdered coriander seeds; 1 ounce powdered Jamaica ginger; $\frac{1}{2}$ ounce powdered allspice. Let all be dry and in fine powder. Mix and pass through a sieve.

II.—Pickling Spice.—Ten pounds small Jamaica ginger; $2\frac{1}{2}$ pounds black peppercorns; $1\frac{1}{2}$ pounds white peppercorns; $1\frac{1}{2}$ pounds allspice; $\frac{3}{4}$ pound long pepper; $1\frac{1}{4}$ pounds mustard seed; $\frac{1}{2}$ pound chili pods. Cut up ginger and long pepper into small pieces, and mix all the other ingredients intimately.

One ounce to each pint of boiling vinegar is sufficient, but it may be made stronger if desired hot.

Essence of Savory Spices.—Two and one-half ounces black peppercorns; 1 ounce pimento; $\frac{3}{4}$ ounce nutmeg; $\frac{1}{2}$ ounce mace; $\frac{1}{2}$ ounce cloves; $\frac{1}{2}$ ounce cinnamon bark; $\frac{1}{4}$ ounce caraway seeds; 20 grains cayenne pepper; 15 ounces spirit of wine; 5 ounces distilled water. Bruise all the spices and having mixed spirit and water, digest in mixture 14 days, shaking frequently, then filter.

MUSTARD:

The Prepared Mustards of Commerce.—The mustard, i. e., the flower or powdered seed, used in preparing the different condiments, is derived from three varieties of *Brassica* (*Cruciferae*)—*Brassica alba* L., *Brassica nigra*, and *Brassica juncea*. The first yields the "white" seed of commerce, which produces a mild mustard; the second the "black" seed, yielding the more pungent powder; and the latter a very pungent and oily mustard, much employed by Russians. The pungency of the condiment is also affected by the method of preparing the paste, excessive heat destroying the sharpness completely. The pungency is further controlled and tempered, in the cold processes, by the addition of wheat or rye flour, which also has the advantage of serving as a binder of the mustard. The mustard flour is prepared by first decorticating the seed, then grinding to a fine powder, the expression of the fixed oil from which completes the process. This oil, unlike the volatile, is of a mild, pleasant taste, and of a greenish color, which, it is said, makes it valuable in the sophistication and imitation of "olive" oils, refined, cottonseed, or peanut oil being thus converted into *huile vierge de Lucca*, Florence, or some other noted brand of olive oil. It is also extensively used for illuminating purposes, especially in southern Russia.

The flavors, other than that of the mustard itself, of the various preparations are imparted by the judicious use of spices—cinnamon, nutmeg, cloves, pimento, etc.—aromatic herbs, such as thyme, sage, chervil, parsley, mint, marjoram, tarragon, etc., and finally chives, onions, shallots, leeks, garlic, etc.

In preparing the mustards on a large scale, the mustard flower and wheat or rye flour are mixed and ground to a smooth paste with vinegar, must (unfermented grape juice), wine, or whatever is used in the preparation, a mill similar to a drug or paint mill being used for the purpose. This dough immediately becomes spongy, and in this condition, technically called "cake," is used as the basis of the various mustards of commerce.

Mustard Cakes.—In the mixture, the amount of flour used depends on the pungency of the mustard flower, and the flavor desired to be imparted to the finished product. The cakes are broadly divided into the yellow and the brown. A general formula for the yellow cake is:

Yellow mustard, from 20 to 30 per cent; salt, from 1 to 3 per cent; spices, from $\frac{1}{4}$ to $\frac{1}{2}$ of 1 per cent; wheat flour, from 8 to 12 per cent.

Vinegar, must, or wine, complete the mixture.

The brown cake is made with black mustard, and contains about the following proportions:

Black mustard, from 20 to 30 per cent; salt, from 1 to 3 per cent; spices, from $\frac{1}{4}$ to $\frac{1}{2}$ of 1 per cent; wheat or rye flour, from 10 to 15 per cent.

The variations are so wide, however, that it is impossible to give exact proportions. In the manufacture of table mustards, in fact, as in every other kind of manufacture, excellence is attained only by practice and the exercise of sound judgment and taste by the manufacturer.

Moutarde des Jesuites.—Twelve sardels and 280 capers are crushed into a paste and stirred into 3 pints of boiling wine vinegar. Add 4 ounces of brown cake and 8 ounces of yellow cake and mix well.

Kirschner Wine Mustard.—Reduce 30 quarts of freshly expressed grape juice to half that quantity, by boiling over a moderate fire, on a water bath. Dissolve in the boiling liquid 5 pounds of sugar, and pour the syrup through a colander containing 2 or 3 large horse-radishes cut

into very thin slices and laid on a coarse towel spread over the bottom and sides of the colander. To the colate add the following, all in a state of fine powder:

Cardamom seeds	2½ drachms
Nutmeg	2½ drachms
Cloves	4½ drachms
Cinnamon	1 ounce
Ginger	1 ounce
Brown mustard cake .	6 pounds
Yellow mustard cake .	9 pounds

Grind all together to a perfectly smooth paste, and strain several times through muslin.

Duesseldorf Mustard.—

Brown mustard cake .	10 ounces
Yellow mustard cake .	48 ounces
Boiling water	96 ounces
Wine vinegar	64 ounces
Cinnamon	5 drachms
Cloves	15 drachms
Sugar	64 ounces
Wine, good white	64 ounces

Mix after the general directions given above.

German Table Mustard.—

Laurel leaves	8 ounces
Cinnamon	5 drachms
Cardamom seeds	2 drachms
Sugar	64 ounces
Wine vinegar	96 ounces
Brown cake	10 ounces
Yellow cake	48 ounces

Mix after general directions as given above.

Krems Mustard, Sweet.—

Yellow cake	10 pounds
Brown cake	20 pounds
Fresh grape juice	6 pints

Mix and boil down to the proper consistency.

Krems Mustard, Sour.—

Brown mustard flour .	30 parts
Yellow mustard flour .	10 parts
Grape juice, fresh	8 parts

Mix and boil down to a paste and then stir in 8 parts of wine vinegar.

Tarragon Mustard.—

Brown mustard flour .	40 parts
Yellow mustard flour .	20 parts
Vinegar	6 parts
Tarragon vinegar	6 parts

Boil the mustard in the vinegar and add the tarragon vinegar.

Tarragon Mustard, Sharp.—This is prepared by adding to every 100 pounds of the above 21 ounces of white pepper, 5 ounces of pimento, and 2½ ounces of cloves,

mixing thoroughly by grinding together in a mill, then put in a warm spot and let stand for 10 days or 2 weeks. Finally strain.

Moutarde aux Epices.—

Mustard flour, yellow .	10 pounds
Mustard flour, brown .	40 pounds
Tarragon	1 pound
Basil, herb	5 ounces
Laurel leaves	12 drachms
White pepper	3 ounces
Cloves	12 drachms
Mace	2 drachms
Vinegar	1 gallon

Mix the herbs and macerate them in the vinegar to exhaustion, then add to the mustards, and grind together. Set aside for a week or ten days, then strain through muslin.

In all the foregoing formulas where the amount of salt is not specified, it is to be added according to the taste or discretion of the manufacturer.

Mustard Vinegar.—

Celery, chopped fine .	32 parts
Tarragon, the fresh herb	6 parts
Cloves, coarsely powdered	6 parts
Onions, chopped fine .	6 parts
Lemon peel, fresh, chopped fine	3 parts
White-wine vinegar . .	575 parts
White wine	515 parts
Mustard seed, crushed	100 parts

Mix and macerate together for a week or 10 days in a warm place, then strain off.

Ravigotte Mustard.—

Parsley	2 parts
Chervil	2 parts
Chives	2 parts
Cloves	1 part
Garlic	1 part
Thyme	1 part
Tarragon	1 part
Salt	8 parts
Olive oil	4 parts
White-wine vinegar . .	128 parts
Mustard flower, sufficient.	

Cut or bruise the plants and spices, and macerate them in the vinegar for 15 or 20 days. Strain the liquid through a cloth and add the salt. Rub up mustard with the olive oil in a vessel set in ice, adding a little of the spiced vinegar from time to time, until the whole is incorporated and the complete mixture makes 384 parts.

CONDIMENTS, TESTS FOR ADULTERATED:

See Foods.

CONDITION POWDERS FOR CATTLE:

See Veterinary Formulas.

CONDUCTIVITY OF ALUMINUM ALLOYS:

See Alloys.

Confectionery

Cream Bonbons for Hoarseness.—Stir into 500 parts of cream 500 parts of white sugar. Put in a pan and cook, with continuous stirring, until it becomes brown and viscid. Now put in a baking tin and smooth out, as neatly as possible, to the thickness of, say, twice that of the back of a table knife and let it harden. Before it gets completely hard draw lines with a knife across the surface in such manner that when it is quite hard it will break along them, easily, into bits the size of a lozenge.

Nut Candy Sticks.—Cook to 320° F. 8 pounds best sugar in 2 pints water, with 4 pounds glucose added. Pour out on an oiled slab and add 5 pounds almonds, previously blanched, cut in small pieces, and dried in the drying room. Mix up well together to incorporate the nuts thoroughly with the sugar. When it has cooled enough to be handled, form into a round mass on the slab and spin out in long, thin sticks.

Fig Squares.—Place 5 pounds of sugar and 5 pounds of glucose in a copper pan, with water enough to dissolve the sugar. Set on the fire, and when it starts to boil add 5 pounds of ground figs. Stir and cook to 240° on the thermometer. Set off the fire, and then add 5 pounds of fine cocoanuts; mix well and pour out on greased marble, roll smooth, and cut like caramels.

Caramels.—Heat 10 pounds sugar and 8 pounds glucose in a copper kettle until dissolved. Add cream to the mixture, at intervals, until 2½ quarts are used. Add 2¼ pounds caramel butter and 12 ounces paraffine wax to the mixture. Cook to a rather stiff ball, add nuts, pour out between iron bars and, when cool enough, cut into strips. For the white ones flavor with vanilla, and add 2 pounds melted chocolate liquor for the chocolate caramel when nearly cooked.

Candy Orange Drops.—It is compar-

atively easy to make a hard candy, but to put the material into "drop" form apparently requires experience and a machine. To make the candy itself, put, say, a pint of water into a suitable pan or kettle, heat to boiling, and add gradually to it 2 pounds or more of sugar, stirring well so as to avoid the risk of burning the sugar. Continue boiling the syrup so formed until a little of it poured on a cold slab forms a mass of the required hardness. If the candy is to be of orange flavor, a little fresh oil of orange is added just before the mass is ready to set and the taste is improved according to the general view at least by adding, also, say, 2 drachms of citric acid dissolved in a very little water. As a coloring an infusion of safflower or tincture of turmeric is used.

To make such a mass into tablets, it is necessary only to pour out on a well-greased slab, turning the edges back if inclined to run, until the candy is firm, and then scoring with a knife so that it can easily be broken into pieces when cold. To make "drops" a suitable mold is necessary.

Experiment as to the sufficiency of the boiling in making candy may be saved and greater certainty of a good result secured by the use of a chemical thermometer. As the syrup is boiled and the water evaporates the temperature of the liquid rises. When it reaches 220° F., the sugar is then in a condition to yield the "thread" form; at 240° "soft ball" is formed; at 245°, "hard ball"; at 252°, "crack"; and at 290°, "hard crack." By simply suspending the thermometer in the liquid and observing it from time to time, one may know exactly when to end the boiling.

Gum Drops.—Grind 25 pounds of Arabian or Senegal gum, place it in a copper pan or in a steam jacket kettle, and pour 3 gallons of boiling water over it; stir it up well. Now set the pan with the gum into another pan containing boiling water and stir the gum slowly until dissolved, then strain it through a No. 40 sieve. Cook 19 pounds of sugar with sufficient water, 2 pounds of glucose, and a teaspoonful of cream of tartar to a stiff ball, pour it over the gum, mix well, set the pan on the kettle with the hot water, and let it steam for 1½ hours, taking care that the water in the kettle does not run dry; then open the door of the stove and cover the fire with ashes, and let the gum settle for nearly an hour, then remove the scum which has settled on top, flavor and run out with the fur-

nel dropper into the starch impressions, and place the trays in the drying room for 2 days, or until dry; then take the drops out of the starch, clean them off well and place them in crystal pans, one or two layers. Cook sugar and water to $34\frac{1}{2}^{\circ}$ on the syrup gauge and pour over the drops lukewarm. Let stand in a moderately warm place over night, then drain the syrup off, and about an hour afterwards knock the gum drops out on a clean table, pick them apart, and place on trays until dry, when they are ready for sale.

A Good Summer Taffy.—Place in a kettle 4 pounds of sugar, 3 pounds of glucose, and $1\frac{1}{2}$ pints of water; when it boils drop in a piece of butter half the size of an egg and about 2 ounces of paraffine wax. Cook to 262° , pour on a slab, and when cool enough, pull, flavor, and color if you wish. Pull until light, then spin out on the table in strips about 3 inches wide and cut into 4- or $4\frac{1}{2}$ -inch lengths. Then wrap in wax paper for the counter. This taffy keeps long without being grained by the heat.

Chewing Candy.—Place 20 pounds of sugar in a copper pan, add 20 pounds of glucose, and enough water to easily dissolve the sugar. Set on the fire or cook in the steam pan in 2 quarts of water. Have a pound of egg albumen soaked in 2 quarts of water. Beat this like eggs into a very stiff froth, add gradually the sugar and glucose; when well beaten up, add 5 pounds of powdered sugar, and beat at very little heat either in the steam beater or on a pan of boiling water until light, and does not stick to the back of the hand, flavor with vanilla, and put in trays dusted with fine sugar. When cold it may be cut, or else it may be stretched out on a sugar-dusted table, cut, and wrapped in wax paper. This chewing candy has to be kept in a very dry place, or else it will run and get sticky.

Montpelier Cough Drops.—

Brown sugar.....	10 pounds
Tartaric acid.....	2 ounces
Cream of tartar.....	$\frac{1}{2}$ ounce
Water.....	$1\frac{1}{2}$ quarts
Anise-seed flavoring,	
quantity sufficient.	

Melt the sugar in the water, and when at a sharp boil add the cream of tartar. Cover the pan for 5 minutes. Remove the lid and let the sugar boil up to crack degree. Turn out the batch on an oiled slab, and when cool enough to handle mold in the acid and flavoring. Pass it through the acid drop rollers, and when

the drops are chipped up, and before sifting, rub some icing with them.

Medicated Cough Drops.—

Light-brown sugar...	14 pounds
Tartaric acid.....	$1\frac{1}{2}$ ounces
Cream of tartar.....	$\frac{1}{2}$ ounce
Water.....	2 quarts
Anise-seed, cayenne,	
clove, and pepper-	
mint flavoring, a few	
drops of each.	

Proceed as before prescribed, but when sufficiently cool pass the batch through the acid tablet rollers and dust with sugar.

Horehound Candy.—

Dutch crushed sugar.	10 pounds
Dried horehound leaves	2 ounces
Cream of tartar.....	$\frac{3}{4}$ ounce
Water.....	2 quarts
Anise-seed flavoring,	
quantity sufficient.	

Pour the water on the leaves and let it gently simmer till reduced to 3 pints; then strain the infusion through muslin, and add the liquid to the sugar. Put the pan containing the syrup on the fire, and when at a sharp boil add the cream of tartar. Put the lid on the pan for 5 minutes; then remove it, and let the sugar boil to stiff boil degree. Take the pan off the fire and rub portions of the sugar against the side until it produces a creamy appearance; then add the flavoring. Stir all well, and pour into square tin frames, previously well oiled.

Menthol Cough Drops.—

Gelatin.....	1 ounce
Glycerine (by weight)	$2\frac{1}{2}$ ounces
Orange-flower water..	$2\frac{1}{2}$ ounces
Menthol.....	5 grains
Rectified spirits.....	1 drachm

Soak the gelatin in the water for 2 hours, then heat on a water bath until dissolved, and add $1\frac{1}{2}$ ounces of glycerine. Dissolve the menthol in the spirit, mix with the remainder of the glycerine, add to the glyco-gelatin mass, and pour into an oiled tin tray (such as the lid of a biscuit box). When the mass is cold divide into 10 dozen pastilles.

Menthol pastilles are said to be an excellent remedy for tickling cough as well as laryngitis. They should be freshly prepared, and cut oblong, so that the patient may take half of one, or less, as may be necessary.

Violet Flavor for Candy.—Violet flavors, like violet perfumes, are very complex mixtures, and their imitation is a

correspondingly difficult undertaking. The basis is vanilla (or vanillin), rose, and orris, with a very little of some pungent oil to bring up the flavor. The following will give a basis upon which a satisfactory flavor may be built:

Oil of orris.....	1 drachm
Oil of rose.....	1 drachm
Vanillin	2 drachms
Cumarin.....	30 grains
Oil of clove.....	30 minims
Alcohol.....	11 ounces
Water.....	5 ounces

Make a solution, adding the water last.

CONFECTIONERY COLORS.—The following are excellent and entirely harmless coloring agents for the purposes named:

Red.—Cochineal syrup prepared as follows:

Cochineal, in coarse powder.....	6 parts
Potassium carbonate	2 parts
Distilled water.....	15 parts
Alcohol.....	12 parts
Simple syrup enough to make	500 parts

Rub up the potassium carbonate and the cochineal together, adding the water and alcohol, little by little, under constant trituration. Set aside over night, then add the syrup and filter.

Pink.—

Carmine.....	1 part
Liquor potassæ.....	6 parts
Rose water, enough to make	48 parts

Mix. Should the color be too high, dilute with water until the requisite tint is acquired.

Orange.—Tincture of red sandalwood, 1 part; ethereal tincture of orlean, quantity sufficient. Add the tincture of orlean to the sandalwood tincture until the desired shade of orange is obtained.

A red added to any of the yellows gives an orange color.

The aniline colors made by the "Aktiengesellschaft für Anilin-Fabrikation," of Berlin, are absolutely non-toxic, and can be used for the purposes recommended, i. e., the coloration of syrups, cakes, candies, etc., with perfect confidence in their innocuity.

Pastille Yellow.—

Citron yellow II.....	7 parts
Grape sugar, first quality.....	1 part
White dextrine.....	2 parts

Sap-Blue Paste.—

Dark blue.....	3 parts
Grape sugar.....	1 part
Water.....	6 parts

Sugar-Black Paste.—

Carbon black.....	3 parts
Grape sugar.....	1 part
Water.....	6 parts

Cinnabar Red.*—

Scarlet.....	65 parts
White dextrine.....	30 parts
Potato flour.....	5 parts

Bluish Rose.*—

Grenadine.....	65 parts
White dextrine.....	30 parts
Potato flour.....	5 parts

Yellowish Rose.—

Rosa II.....	60 parts
Citron yellow.....	5 parts
White dextrine.....	30 parts
Potato flour.....	5 parts

Violet.—

Red violet.....	65 parts
White dextrine.....	30 parts
Potato flour.....	5 parts

Carmine Green.—

Woodruff (Waldmeister) green.....	55 parts
Rosa II.....	5 parts
Dextrine.....	35 parts
Potato flour.....	5 parts

To the colors marked with an asterisk (*) add, for every 4 pounds, 4½ ounces, a grain and a half each of potassium iodide and sodium nitrate. Colors given in form of powders should be dissolved in hot water for use.

Yellow.—Various shades of yellow may be obtained by the maceration of Besicello saffron, or turmeric, or grains d'Avignon in alcohol until a strong tincture is obtained. Dilute with water until the desired shade is obtained. An aqueous solution of quercitrine also gives an excellent yellow.

Blue.—

Indigo carmine.....	1 part
Water.....	2 parts

Mix.

Indigo carmine is a beautiful, powerful, and harmless agent. It may usually be bought commercially, but if it cannot be readily obtained, proceed as follows:

Into a capsule put 30 grains of indigo in powder, place on a water bath, and heat to dryness. When entirely dry put

into a large porcelain mortar (the substance swells enormously under subsequent treatment—hence the necessity for a large, or comparatively large, mortar) and cautiously add, drop by drop, 120 grains, by weight, of sulphuric acid, C. P., stirring continuously during the addition. Cover the swollen mass closely, and set aside for 24 hours. Now add 3 fluidounces of distilled water, a few drops at a time, rubbing or stirring continuously. Transfer the liquid thus obtained to a tall, narrow, glass cylinder or beaker, cover and let stand for 4 days, giving the liquid an occasional stirring. Make a strong solution of sodium carbonate or bicarbonate, and at the end of the time named cautiously neutralize the liquid, adding the carbonate a little at a time, stirring the indigo solution and testing it after each addition, as the least excess of alkali will cause the indigo to separate out, and fall in a doughy mass. Stop when the test shows the near approach of neutrality, as the slight remaining acidity will not affect the taste or the properties of the liquid. Filter, and evaporate in the water bath to dryness. The resultant matter is sulphindigotate of potassium, or the "indigo carmine" of commerce.

Tincture of indigo may also be used as a harmless blue.

Green.—The addition of the solution indigo carmine to an infusion of any of the matters given under "yellow" will produce a green color. Tincture of crocus and glycerine in equal parts, with the addition of indigo-carmine solution, also gives a fine green. A solution of commercial chlorophyll gives grass-green, in shades varying according to the concentration of the solution.

Voice and Throat Lozenges.—

Catechu.....	191 grains
Tannic acid.....	273 grains
Tartaric acid.....	273 grains
Capsicin.....	30 minims
Black-currant paste.	7 ounces
Refined sugar,	
Mucilage of acacia,	
of each a sufficient	
quantity.	

Mix to produce 7 pounds of lozenges.

CONSTIPATION IN BIRDS:

See Veterinary Formulas.

COOKING TABLE:

See Tables.

COOLING SCREEN:

See Refrigeration.

Copper

Annealing Copper.—

Copper is almost universally annealed in muffles, in which it is raised to the desired temperature, and subsequently allowed to cool either in the air or in water. A muffle is nothing more or less than a reverberatory furnace. It is necessary to watch the copper carefully, so that when it has reached the right temperature it may be drawn from the muffle and allowed to cool. This is important, for if the copper is heated too high, or is left in the muffle at the ordinary temperature of annealing too long, it is burnt, as the workmen say. Copper that has been burnt is yellow, coarsely granular, and exceedingly brittle—even more brittle at a red heat than when cold.

In the case of coarse wire it is found that only the surface is burnt, while the interior is damaged less. This causes the exterior to split loose from the interior when bent or rolled, thus giving the appearance of a brittle copper tube with a copper wire snugly fitted into it. Cracks a half inch in depth have been observed on the surface of an ingot on its first pass through the rolls, all due to this exterior burning. It is apparent that copper that has been thus overheated in the muffle is entirely unfit for rolling. It is found that the purer forms of copper are less liable to be harmed by overheating than samples containing even a small amount of impurities. Even the ordinary heating in a muffle will often suffice to burn in this manner the surface of some specimens of copper, rendering them unfit for further working. Copper that has been thus ruined is of use only to be refined again.

As may be inferred only the highest grades of refined copper are used for drawing or for rolling. This is not because the lower grades, when refined, cannot stand sufficiently high tests, but because methods of working are not adequate to prevent these grades of copper from experiencing the deterioration due to overheating.

The process of refining copper consists in an oxidizing action followed by a reducing action which, since it is performed by the aid of gases generated by stirring the melted copper with a pole, is called poling. The object of the oxidation is to oxidize and either volatilize or turn to slag all the impurities contained in the copper. This procedure is materially aided by the fact that the sub-

oxide of copper is freely soluble in metallic copper and thus penetrates to all parts of the copper, and parting with its oxygen, oxidizes the impurities. The object of the reducing part of the refining process is to change the excess of the suboxide of copper to metallic copper. Copper containing even less than 1 per cent of the suboxide of copper shows decreased malleability and ductility, and is both cold-short and red-short. If the copper to be refined contains any impurities, such as arsenic or antimony, it is well not to remove too much of the oxygen in the refining process. If this is done, overpoled copper is produced. In this condition it is brittle, granular, of a shining yellow color, and more red-short than cold-short. When the refining has been properly done, and neither too much nor too little oxygen is present, the copper is in the condition of "tough pitch," and is in a fit state to be worked.

Copper is said to be "tough pitch" when it requires frequent bending to break it, and when, after it is broken, the color is pale red, the fracture has a silky luster, and is fibrous like a tuft of silk. On hammering a piece to a thin plate it should show no cracks at the edge. At tough pitch copper offers the highest degree of malleability and ductility of which a given specimen is capable. This is the condition in which refined copper is (or should be) placed on the market, and if it could be worked without changing this tough pitch, any specimen of copper that could be brought to this condition would be suitable for rolling or drawing. But tough pitch is changed if oxygen is either added or taken from refined copper.

By far the more important of these is the removal of oxygen, especially from those specimens that contain more than a mere trace of impurities. This is shown by the absolutely worthless condition of overpoled copper. The addition of carbon also plays a very important part in the production of overpoled copper.

That the addition of oxygen to refined copper is not so damaging is shown by the fact that at present nearly all the copper that is worked is considerably oxidized at some stage of the process, and not especially to its detriment.

Burnt copper is nothing more or less than copper in the overpoled condition. This is brought about by the action of reducing gases in the muffle. By this means the small amount of oxygen necessary to give the copper its tough pitch is removed. This oxygen is combined

with impurities in the copper, and thus renders them inert. For example, the oxide of arsenic or antimony is incapable of combining more than mechanically with the copper, but when its oxygen is removed the arsenic or antimony is left free to combine with the copper. This forms a brittle alloy, and one that corresponds almost exactly in its properties with overpoled copper. To be sure overpoled copper is supposed to contain carbon, but that this is not the essential ruling principle in case of annealing is shown by the fact that pure copper does not undergo this change under conditions that ruin impure copper, and also by the fact that the same state may be produced by annealing in pure hydrogen and thus removing the oxygen that renders the arsenic or antimony inert. No attempt is made to deny the well-known fact that carbon does combine with copper to the extent of 0.2 per cent and cause it to become exceedingly brittle. It is simply claimed that this is probably not what occurs in the production of so-called burnt copper during annealing. The amount of impurities capable of rendering copper easily burnt is exceedingly small. This may be better appreciated when it is considered that from 0.01 to 0.2 per cent expresses the amount of oxygen necessary to render the impurities inert. The removal of this very small amount of oxygen, which is often so small as to be almost within the limits of the errors of analysis, will suffice to render copper overpoled and ruin it for any use.

There are methods of avoiding the numerous accidents that may occur in the annealing of copper, due to a change of pitch. As already pointed out, the quality of refined copper is lowered if oxygen be either added to or taken from it. It is quite apparent, therefore, that a really good method of annealing copper will prevent any change in the state of oxidation. It is necessary to prevent access to the heated copper both of atmospheric air, which would oxidize it, and of the reducing gases used in heating the muffle, which would take oxygen away from it. Obviously the only way of accomplishing this is to inclose the copper when heated and till cool in an atmosphere that can neither oxidize nor deoxidize copper. By so doing copper may be heated to the melting point and allowed to cool again without suffering as regards its pitch. There are comparatively few gases that can be used for this purpose, but, fortunately, one which is exceedingly cheap and universally

prevalent fulfills all requirements, viz., steam. In order to apply the principles enunciated it is necessary only to anneal copper in the ordinary annealing pots such as are used for iron, care being taken to inclose the copper while heating and while cooling in an atmosphere of steam. This will effectually exclude air and prevent the ingress of gases used in heating the annealer. Twenty-four hours may be used in the process, as in the annealing of iron wire, with no detriment to the wire. This may seem incredible to those manufacturers who have tried to anneal copper wire after the manner of annealing iron wire. By this method perfectly bright annealed wire may be produced. Such a process of annealing copper offers many advantages. It allows the use of a grade of copper that has hitherto been worked only at a great disadvantage, owing to its tendency to get out of pitch. It allows the use of annealers such as are ordinarily employed for annealing iron, and thus cheapens the annealing considerably as compared with the present use of muffles. There is no chance of producing the overpoled condition from the action of reducing gases used in heating the muffles. There is no chance of producing the underpoled condition due to the absorption of suboxide of copper. None of the metal is lost as scale, and the saving that is thus effected amounts to a considerable percentage of the total value of the copper. The expense and time of cleaning are wholly saved. Incidentally bright annealed copper is produced by a process which is applicable to copper of any shape, size, or condition—a product that has hitherto been obtained only by processes (mostly secret) which are too cumbersome and too expensive for extensive use; and, as is the case with at least one process, with the danger of producing the overpoled condition, often in only a small section of the wire, but thus ruining the whole piece.

COPPER COLORING:

Blackening Copper.—To give a copper article a black covering, clean it with emery paper, heat gently in a Bunsen or a spirit flame, immerse for 10 seconds in solution of copper filings in dilute nitric acid, and heat again.

Red Coloring of Copper.—A fine red color may be given to copper by gradually heating it in an air bath. Prolonged heating at a comparatively low temperature, or rapid heating at a high temperature, produces the same result. As

soon as the desired color is attained the metal should be rapidly cooled by quenching in water. The metal thus colored may be varnished.

To Dye Copper Parts Violet and Orange.—Polished copper acquires an orange-like color leaning to gold, when dipped for a few seconds into a solution of crystallized copper acetate. A handsome violet is obtained by placing the metal for a few minutes in a solution of antimony chloride and rubbing it afterwards with a piece of wood covered with cotton. During this operation the copper must be heated to a degree bearable to the hand. A crystalline appearance is produced by boiling the article in copper sulphate.

Pickle for Copper.—Take nitric acid, 100 parts; kitchen salt, 2 parts; calcined soot, 2 parts; or nitric acid, 10 parts; sulphuric acid, 10 parts; hydrochloric acid, 1 part. As these bleaching baths attack the copper quickly, the objects must be left in only for a few seconds, washing them afterwards in plenty of water, and drying in sawdust, bran, or spent tan.

Preparations of Copper Water.—I.—Water, 1,000 parts; oxalic acid, 30 parts; spirit of wine, 100 parts; essence of turpentine, 50 parts; fine tripoli, 100 parts.

II.—Water, 1,000 parts; oxalic acid, 30 parts; alcohol, 50 parts; essence of turpentine, 40 parts; fine tripoli, 50 parts.

III.—Sulphuric acid, 300 parts; sulphate of alumina, 80 parts; water, 520 parts.

Tempered Copper.—Objects made of copper may be satisfactorily tempered by subjecting them to a certain degree of heat for a determined period of time and bestrewing them with powdered sulphur during the heating. While hot the objects are plunged into a bath of blue vitriol; after the bath they may be heated again.

COPPER ALLOYS:

See Alloys.

COPPER CLEANING:

See Cleaning Preparations and Methods.

COPPER ETCHING:

See Etching.

COPPER IN FOOD:

See Food.

COPPER LACQUERS:

See Lacquers.

COPPER PAPER:

See Paper, Metallic.

COPPER PATINIZING AND PLATING:

See Plating.

COPPER POLISHES:

See Polishes.

COPPER, SEPARATION OF GOLD FROM:

See Gold.

COPPER SOLDER:

See Solders.

COPPER VARNISHES:

See Varnishes.

COPYING PRINTED PICTURES.

The so-called "metallic" paper used for steam-engine indicator cards has a smooth surface, chemically prepared so that black lines can be drawn upon it with pencils made of brass, copper, silver, aluminum, or any of the softer metals. When used on the indicator it receives the faint line drawn by a brass point at one end of the pencil arm, and its special advantage over ordinary paper is that the metallic pencil slides over its surface with very little friction, and keeps its point much longer than a graphite pencil.

This paper can be used as a transfer paper for copying engravings or sketches, or anything printed or written in ink or drawn in pencil.

The best copies can be obtained by following the directions below: Lay the metallic transfer paper, face up, upon at least a dozen sheets of blank paper, and lay the print face down upon it. On the back of the print place a sheet of heavy paper, or thin cardboard, and run the rubbing tool over this protecting sheet. In this manner it is comparatively easy to prevent slipping, and prints 8 or 10 inches on a side may be copied satisfactorily.

Line drawings printed from relief plates, or pictures with sharp contrast of black and white, without any half-tones, give the best copies. Very few half-tones can be transferred satisfactorily; almost all give streaked, indistinct copies, and many of the results are worthless.

The transfer taken off as described is a reverse of the original print. If the question of right and left is not important this reversal will seldom be objectionable, for it is easy to read backward what few letters generally occur. However, if desired, the paper may be held up to the light and examined from the back, or placed before a mirror and

viewed by means of its reflected image, when the true relations of right and left will be seen. Moreover, if sufficiently important, an exact counterpart of the original may be taken from the reversed copy by laying another sheet face downward upon it, and rubbing on the back of the fresh sheet just as was done in making the reversed copy. The impression thus produced will be fainter than the first, but almost always it can be made dark enough to show a distinct outline which may afterwards be retouched with a lead pencil.

For indicator cards the paper is prepared by coating one surface with a suitable compound, usually zinc oxide mixed with a little starch and enough glue to make it adhere. After drying it is passed between calendar rolls under great pressure. The various brands manufactured for the trade, though perhaps equally good for indicator diagrams, are not equally well suited for copying. If paper of firmer texture could be prepared with the same surface finish, probably much larger copies could be produced.

Other kinds of paper, notably the heavy plate papers used for some of the best trade catalogues, possess this transfer property to a slight degree, though they will not receive marks from a metallic pencil. The latter feature would seem to recommend them for transfer purposes, making them less likely to become soiled by contact with metallic objects, but so far no kind has been found which will remove enough ink to give copies anywhere near as dark as the indicator paper.

Fairly good transfers can be made from almost any common printers' ink, but some inks copy much better than others, and some yield only the faintest impressions. The length of time since a picture was printed does not seem to determine its copying quality. Some very old prints can be copied better than new ones; in fact, it was by accidental transfer to an indicator card from a book nearly a hundred years old that the peculiar property of this "metallic" paper was discovered.

Copying Process on Wood.—If wood surfaces are exposed to direct sunlight the wood will exhibit, after 2 weeks action, a browning of dark tone in the exposed places. Certain parts of the surface being covered up during the entire exposure to the sun, they retain their original shade and are set off clearly and sharply against the parts browned by the sunlight. Based on this property of the

wood is a sun-copying process on wood. The method is used for producing tarsia in imitation on wood. A pierced stencil of tin, wood, or paper is laid on a freshly planed plate of wood, pasting it on in places to avoid shifting, and put into a common copying frame. To prevent the wood from warping a stretcher is employed, whereupon expose to the sun for from 8 to 14 days. After the brown shade has appeared the design obtained is partly fixed by polishing or by a coating of varnish, lacquer, or wax. Best suited for such works are the pine woods, especially the 5-year fir and the cembra pine, which, after the exposure, show a yellowish brown tone of handsome golden gloss, that stands out boldly, especially after subsequent polishing, and cannot be replaced by any stain or by pyrography. The design is sharper and clearer than that produced by painting. In short, the total effect is pleasing.

How to Reproduce Old Prints.—Prepare a bath as follows: Sulphuric acid, 3 to 5 parts (according to the antiquity of print, thickness of paper, etc.); alcohol, 3 to 5 parts; water, 100 parts. In this soak the print from 5 to 15 minutes (the time depending on age, etc., as above), remove, spread face downward on a glass or ebonite plate, and wash thoroughly in a gentle stream of running water. If the paper is heavy, reverse the sides, and let the water flow over the face of the print. Remove carefully and place on a heavy sheet of blotting paper, cover with another, and press out every drop of water possible. Where a wringing machine is convenient and sufficiently wide, passing the blotters and print through the rollers is better than mere pressing with the hands. The print, still moist, is then laid face upward on a heavy glass plate (a marble slab or a lithographers' stone answers equally well), and smoothed out. With a very soft sponge go over the surface with a thin coating of gum-arabic water. The print is now ready for inking, which is done exactly as in lithographing, with a roller and printers' or lithographers' ink, cut with oil of turpentine. Suitable paper is then laid on and rolled with a dry roller. This gives a reverse image of the print, which is then applied to a zinc plate or a lithographers' stone, and as many prints as desired pulled off in the usual lithographing method. When carefully done and the right kind of paper used, it is said that the imitation of the original is perfect in every detail.

To Copy Old Letters, Manuscripts, etc.—If written in the commercial ink of the period from 1860 to 1864, which was almost universally an iron and tannin or gallic-acid ink, the following process may succeed: Make a thin solution of glucose, or honey, in water, and with this wet the paper in the usually observed way in copying recent documents in the letter book, put in the press, and screw down tightly. Let it remain in the press somewhat longer than in copying recent documents. When removed, before attempting to separate the papers, expose to the fumes of strong water of ammonia, copy side downward.

CORDAGE:

See also Ropes.

Strong Twine.—An extraordinarily strong pack thread or cord, stronger even than the so-called "Zuckerschnur," may be obtained by laying the thread of fibers in a strong solution of alum, and then carefully drying them.

Preservation of Fishing Nets.—The following recipe for the preservation of fishing nets is also applicable to ropes, etc., in contact with water. Some have been subjected to long test.

For 40 parts of cord, hemp, or cotton, 3 parts of kutch, 1 part of blue vitriol, $\frac{1}{2}$ part of potassium chromate, and $2\frac{1}{2}$ parts of wood tar are required. The kutch is boiled with 150 parts of water until dissolved, and then the blue vitriol is added. Next, the net is entered and the tar added. The whole should be stirred well, and the cordage must boil 5 to 8 minutes. Now take out the netting, lay it in another vessel, cover up well, and leave alone for 12 hours. After that it is dried well, spread out in a clean place, and coated with linseed oil. Not before 6 hours have elapsed should it be folded together and put into the water. The treatment with linseed oil may be omitted.

CORDAGE LUBRICANT:

See Lubricants.

CORDAGE WATERPROOFING:

See Waterproofing.

CORDIALS:

See Wines and Liquors.

CORKS:

Impervious Corks.—Corks which have been steeped in petrolatum are said to be an excellent substitute for glass stoppers. Acid in no way affects them and chemical fumes do not cause decay in them, neither do they become fixed by a blow or long disuse.

Non-Porous Corks.—For benzine, turpentine, and varnish cans, immerse the corks in hot melted paraffine. Keep them under about 5 minutes; hold them down with a piece of wire screen cut to fit the dish in which you melt the paraffine. When taken out lay them on a screen till cool. Cheap corks can in this way be made gas- and air-tight, and can be cut and bored with ease.

Substitute for Cork.—Wood pulp or other ligneous material may be treated to imitate cork. For the success of the composition it is necessary that the constituents be mingled and treated under special conditions. The volumetric proportions in which these constituents combine with the best results are the following: Wood pulp, 3 parts; cornstalk pith, 1 part; gelatin, 1 part; glycerine, 1 part; water, 4 parts; 20 per cent formic-aldehyde solution, 1 part; but the proportions may be varied. After disintegrating the ligneous substances, and while these are in a moist and hot condition they are mingled with the solution of gelatin, glycerine, and water. The mass is stirred thoroughly so as to obtain a homogeneous mixture. The excess of moisture is removed. As a last operation the formic aldehyde is introduced, and the mass is left to coagulate in this solution. The formic aldehyde renders the product insoluble in nearly all liquids. So it is in this last operation that it is necessary to be careful in producing the composition properly. When the operation is terminated the substance is submitted to pressure during its coagulation, either by molding it at once into a desired form, or into a mass which is afterwards converted into the finished product.

CORKS, TO CLEAN:

See Cleaning Preparations and Methods, under Miscellaneous Methods.

CORK TO METAL, FASTENING:

See Adhesives, under Pastes.

CORK AS A PRESERVATIVE:

See Preserving.

CORKS, WATERPROOFING:

See Waterproofing.

CORN CURES:

I.—Salicylic-Acid Corn Cure.—Extract cannabis indica, 1 part, by measure; salicylic acid, 10 parts, by measure; oil of turpentine, 5 parts, by measure; acetic acid, glacial, 2 parts, by measure; cocaine, alkaloidal, 2 parts, by measure; collodion, elastic, sufficient to make 100 parts. Apply a thin coating every night, putting each layer directly on the pre-

ceding one. After a few applications, the mass drops off, bringing the indurated portion, and frequently the whole of the corn, off with it.

II.—Compound Salicylated Collodion Corn Cure.—Salicylic acid, 11 parts, by weight; extract of Indian hemp, 2 parts, by weight; alcohol, 10 parts, by weight; flexible collodion, U. S. P., a sufficient quantity to make 100 parts, by weight.

The extract is dissolved in the alcohol and the acid in about 50 parts, by weight, of collodion, the solutions mixed, and the liquid made up to the required amount. The Indian hemp is presumably intended to prevent pain; whether it serves this or any other useful purpose seems a matter of doubt. The acid is frequently used without this addition.

III.—Extract of cannabis indica, 90 grains; salicylic acid, 1 ounce; alcohol, 1 ounce; collodion enough to make 10 ounces. Soften the extract with the alcohol, then add the collodion, and lastly the acid.

IV.—Resorcin, 1 part, by weight; salicylic acid, 1 part, by weight; lactic acid, 1 part, by weight; collodion elasticum, 10 parts, by weight. Paint the corn daily for 5 or 6 days with the above solution and take a foot bath in very hot water. The corn will readily come off.

Corn Plaster.—Yellow wax, 24 parts, by weight; Venice turpentine, 3 parts, by weight; rosin, 2 parts, by weight; salicylic acid, 2 parts, by weight; balsam of Peru, 2 parts, by weight; lanolin, 4 parts, by weight.

Corn Cure.—Melt soap plaster, 85 parts, by weight, and yellow wax, 5 parts by weight, in a vapor bath, and stir finely ground salicylic acid, 10 parts, by weight, into it.

Removal of Corns.—The liquid used by chiropodists with pumice stone for the removal of corns and callosities is usually nothing more than a solution of potassa or concentrated lye, the pumice stone being dipped into the solution by the operator just before using.

Treatment of Bunions.—Wear right and left stockings and shoes, the inner edges of the sole of which are perfectly straight. The bunion is bathed night and morning in a 4 per cent solution of carbolic acid for a few minutes, followed by plain water. If, after several weeks, the bursa is still distended with fluid, it is aspirated. If the bunion is due to flatfoot, the arch of the foot must be restored by a plate. When the joints are enlarged because of gout or rheuma-

tism, the constitutional conditions must be treated. In other cases, osteotomy and tenotomy are required.

The Treatment of Corns.—Any corn may be speedily and permanently cured. The treatment is of three kinds—preventive, palliative, and curative.

I.—The preventive treatment lies in adopting such measures as will secure freedom from pressure and friction for the parts most liable to corns. To this end a well-fitting shoe is essential. The shoes should be of well-seasoned leather, soft and elastic, and should be cut to a proper model.

II.—The palliative treatment is generally carried out with chemical substances. The best method, is, briefly, as follows: A ring of glycerine jelly is painted around the circumference of the corn, to form a raised rampart. A piece of salicylic plaster mull is then cut to the size and shape of the central depression, and applied to the surface of the corn. This is then covered with a layer of glycerine jelly, and before it sets a pad of cotton wool is applied to the surface. This process is repeated as often as is necessary, until the horny layer separates and is cast off.

If the point of a sharp, thin-bladed knife be introduced at the groove which runs around the margin of the corn, and be made to penetrate toward its central axis, by the exercise of a little manual dexterity the horny part of the corn can be easily made to separate from the parts beneath.

III.—Any method of treatment to be curative must secure the removal of the entire corn, together with the underlying bursa. It is mainly in connection with the latter structure that complications, which alone make a corn a matter of serious import, are likely to arise. Freeland confidently advises the full and complete excision of corns, on the basis of his experience in upward of 60 cases.

Every precaution having been taken to render the operation aseptic, a spot is selected for the injection of the anæsthetic solution. The skin is rendered insensitive with ethyl chloride, and 5 minims of a 4 per cent solution of cocaine is injected into the subcutaneous tissue beneath the corn. After a wait of a few minutes the superficial parts of the site of the incision are rendered insensitive with ethyl chloride. Anæsthesia is now complete.

Two semielliptical incisions meeting at their extremities are made through the skin around the circumference of the

growth, care being taken that they penetrate well into the subcutaneous tissue. Seizing the parts included in the incision with a pair of dissecting forceps, a wedge-shaped piece of tissue—including the corn, a layer of skin and subcutaneous tissue, and the bursa if present—is dissected out. The oozing is pretty free, and it is sometimes necessary to torsion a small vessel; but the hemorrhage is never severe. The edges of the wound are brought together by one or two fine sutures; an antiseptic dressing is applied, and the wound is left to heal—primary union in a few days being the rule. The rapidity of the healing is often phenomenal. There is produced a scar tissue at the site of the corn, but this leads to no untoward results.

Cosmetics

COLD CREAM.

I.—Oil of almonds	425	parts
Lanolin	185	parts
White wax	62	parts
Spermaceti	62	parts
Borax	4.5	parts
Rose water	300	parts

Melt together the first four ingredients, then incorporate the solution of borax in the rose water.

II.—Tragacanth	125	parts
Boric acid	100	parts
Glycerine	140	parts
Expressed oil of almonds	50	parts
Glyconine	50	parts
Oil of lavender	0.5	parts
Water enough to make	1,000	parts

Mix the tragacanth and the boric acid with the glycerine; add the almond oil, lavender oil, and egg glycerite, which have been previously well incorporated, and, lastly, add the water in divided portions until a clear jelly of the desired consistency is obtained.

III.—Oil of almonds	26	ounces
Castor oil (odorless) . . .	6	ounces
Lard (benzoated)	8	ounces
White wax	8	ounces
Rose water (in winter less, in summer more, than quantity named) . .	12	ounces
Orange-flower water . . .	8	ounces
Oil of rose	15	minims
Extract of jasmine . . .	6	drachms
Extract of cassia	4	drachms
Borax	2	ounces
Glycerine	4	ounces

Melt the oil of sweet almonds, wax, and lard together, and stir in the castor oil; make a solution of the borax in the glycerine and rose and orange-flower waters; add this solution, a little at a time, to the melted fat, stirring constantly to insure thorough incorporation; finally add the oil of rose dissolved in the extracts, and beat the ointment until cold.

IV.—Spermaceti (pure), $\frac{1}{4}$ ounce; white wax (pure), $\frac{1}{4}$ ounce; almond oil, $\frac{1}{4}$ pound; butter of cocoa, $\frac{1}{4}$ pound; lanolin, 2 ounces.

Melt and stir in 1 drachm of balsam of Peru. After settling, pour off the clear portion and add 2 fluidrachms of orange-flower water and stir briskly until it concretes.

Camphorated Cold Cream.—

Oil of sweet almonds.....	8 fluidounces
White wax.....	1 ounce
Spermaceti.....	1 ounce
Camphor.....	1 ounce
Rose water.....	5 fluidounces
Borax (in fine powder).....	4 drachms
Oil of rose.....	10 drops

Melt the wax and spermaceti, add the oil of sweet almonds, in which the camphor has been dissolved with very gentle heat; then gradually add the rose water, in which the borax has previously been dissolved, beating or agitating constantly with a wooden spatula until cold. Lastly add the oil of rose.

Petrolatum Cold Cream.—

Petrolatum (white)...	7 ounces
Paraffine.....	$\frac{1}{2}$ ounce
Lanolin.....	2 ounces
Water.....	3 ounces
Oil of rose.....	3 drops
Alcohol.....	1 drachm

A small quantity of borax may be added, if desirable, and the perfume may be varied to suit the taste.

LIP SALVES:

Pomades for the Lips.—Lip pomatum which is said always to retain a handsome red color and never to grow rancid is prepared as follows:

I.—Paraffine.....	80.0 parts
Vaseline.....	80.0 parts
Anchusine.....	0.5 parts
Bergamot oil.....	1.0 part
Lemon peel.....	1.0 part

II.—Vaseline Pomade.—

Vaseline oil, white...	1,000 parts
Wax, white.....	300 parts

Geranium oil, African.....

Lemon oil.....	40 parts
	20 parts

III.—Rose Pomade.—

Almond oil.....	1,000 parts
Wax, white.....	300 parts
Alkannin.....	3 parts
Geranium oil.....	20 parts

IV.—Yellow Pomade.—

Vaseline oil, white.	1,000 parts
Wax, white.....	200 parts
Spermaceti.....	200 parts
Saffron surrogate.	10 parts
Clove oil.....	20 parts

V.—White Pomade.—

Vaseline oil, white.	1,000 parts
Wax, white.....	300 parts
Bitter almond oil, genuine.....	10 parts
Lemon oil.....	2 parts

VI.—Paraffine.....

Paraffine.....	49.0 parts
Vaseline.....	49.0 parts
Oil of lemon.....	0.75 parts
Oil of violet.....	0.75 parts
Carmine, quantity sufficient.	

Lipol.—For treating sore, rough, or inflamed lips, apply the following night and morning, rubbing in well with the finger tips: Camphor, $\frac{1}{2}$ ounce; menthol, $\frac{1}{4}$ ounce; eucalyptol, 1 drachm; petrolatum (white), 1 pound; paraffine, $\frac{1}{2}$ pound; alkanet root, $\frac{1}{2}$ ounce; oil of bitter almonds, 15 drops; oil of cloves, 10 drops; oil of cassia, 5 drops. Digest the root in the melted paraffine and petrolatum, strain, add the other ingredients and pour into lip jars, hot.

MANICURE PREPARATIONS:

Powdered Nail Polishes.—

I.—Tin oxide.....	8 drachms
Carmine.....	$\frac{1}{2}$ drachm
Rose oil.....	6 drops
Neroli oil.....	5 drops
II.—Cinnabar.....	1 drachm
Infusorial earth.....	8 drachms
III.—Putty powder (fine).	4 drachms
Carmine.....	2 grains
Oil of rose.....	1 drop
IV.—White castile soap...	1 part
Hot water.....	16 parts
Zinc chloride solution, 10 per cent, quantity sufficient.	

Dissolve the soap in the water and to the solution add the zinc-chloride solution until no further precipitation occurs. Let stand over night; pour off the supernatant fluid, wash the precipitate

well with water, and dry at the ordinary temperature. Carmine may be added if desired.

Polishing Pastes for the Nails.—

- I.—Talcum 5 drachms
 Stannous oxide 3 drachms
 Powdered tragacanth 5 grains
 Glycerine 1 drachm
 Rose water, quantity
 sufficient.

Solution of carmine
 sufficient to tint.

Make paste.

For softening the nails, curing hang-nails, etc., an ointment is sometimes used consisting of white petrolatum, 8 parts; powdered castile soap, 1 part; and perfume to suit.

- II.—Eosine 10 grains
 White wax 1/2 drachm
 Spermaceti 1/2 drachm
 Soft paraffine 1 ounce
 Alcohol, a sufficient quantity.

Dissolve the eosine in as little alcohol as will suffice, melt the other ingredients together, add the solution, and stir until cool.

Nail-Cleaning Washes.—

- I.—Tartaric acid 1 drachm
 Tincture of myrrh.. 1 drachm
 Cologne water 2 drachms
 Water 3 ounces

Dissolve the acid in the water; mix the tincture of myrrh and cologne, and add to the acid solution.

Dip the nails in this solution, wipe, and polish with chamois skin.

I.—Benzoin Nail Enamel.—

- Benzoin 7 oz.
 Alcohol 95% 14 oz.
 Meth. ether 14 oz.
 Methyl acetophenone . 1 gram
 5% solution of eosine 4 drops

Dry the nails and apply the varnish with a camel's hair brush. Before applying the second coat allow the first to dry about 3 minutes. Allow the second coat to dry for 10 minutes and rub to a high polish with a silk handkerchief.

This polish is brilliant and will remain for several days.

II.—Nail Enamel.—

- Celluloid 1/5 oz.
 Amyl acetate 2 oz.
 Acetone 6 oz.
 Phloxine 1 gram

Dissolve the celluloid which may be cleaned moving picture film in the mixture of amyl acetate and acetone. If necessary warm slightly to obtain a syrupy liquid. Keep in well stoppered bottle.

After removing any old enamel from the nails with enamel remover cleanse them thoroughly and apply the enamel with a camel's hair brush. Do not apply the second coat until the first has dried perfectly. *Caution.—Do not bring near flame when making or applying.*

I.—Nail Polish Remover.—

- Amyl Acetate 1 oz.
 Acetone 1 oz.

II.

- Alcohol 1 oz.
 Ether 1 oz.
 Acetone 1 oz.

Apply to the nails with a brush and before it dries rub off with a cloth.

REMOVER FOR CUTICLE:

- Sodium hydroxide .. 4 ounces
 Water 2 1/2 gallons

Dissolve these two items in a stone jar, to which add two ounces of glycerine and thirty drops of oil of rose geranium. If this mixture is then put in bottles having corks for stoppers, the corks should be dipped in melted paraffin wax.

POMADES:

I.—Herb Pomade.—

- Vaseline oil, yellow 20,000 parts
 Ceresine, yellow .. 5,000 parts
 Chlorophyll 20 parts
 Lemon oil 50 parts
 Clove oil 20 parts
 Geranium oil, Afri-
 can 12 parts
 Curled mint oil ... 4 parts

II.—Rose Pomade.—

- Vaseline oil, white. 20,000 parts
 Ceresine, white ... 5,000 parts
 Alkannin 15 parts
 Geranium oil, Afri-
 can 50 parts
 Palmarosa oil 30 parts
 Lemon oil 20 parts

III.—Strawberry Pomade.— When the strawberry season is on, and berries are plenty and cheap, the following is timely:

- Strawberries, ripe and
 fresh 4 parts
 Lard, sweet and fresh 25 parts
 Tallow, fresh 5 parts
 Alkanet tincture,
 quantity sufficient.
 Essential oil, quantity
 sufficient to perfume.

Melt lard and tallow together on the water bath at the temperature of boiling water. Have the strawberries arranged on a straining cloth. Add the alkanet tincture to the melted grease, stir in, and

then pour the mixture over the berries. Stir the strained fats until the mass begins to set, then add the perfume and stir in. A little artificial essence of strawberries may be added. The odor usually employed is rose, about 1 drop to every 2 pounds.

IV.—Stick Pomade.—

Tallow	500 parts
Ceresine	150 parts
Wax, yellow	50 parts
Rosin, light	200 parts
Paraffine oil (thick) ..	300 parts
Oil of cassia	5 parts
Oil of bergamot	5 parts
Oil of clove	2 parts

V.—Petrolatum Pomade.—Melt 250 parts of freshly rendered lard and 25 parts of white wax at moderate heat and mix well with 200 parts of Petrolatum. Add 15 parts of bergamot oil, 3 parts of lavender oil, 2 parts of geranium oil, and 2 parts of lemon oil, mixing well.

VI.—Witch-Hazel Jelly.—

Oil of sweet almonds	256 parts
Extract of witch-hazel fluid	10 parts
Glycerine	32 parts
Soft soap	20 parts
Tincture of musk, quantity sufficient to perfume.	

Mix in a large mortar the glycerine and soft soap and stir until incorporated. Add and rub in the witch-hazel, and then add the oil, slowly, letting it fall in a very thin, small stream, under constant agitation; add the perfume, keeping up the agitation until complete incorporation is attained. Ten drops of musk to a quart of jelly is sufficient. Any other perfume may be used.

Colors for Pomade.—Pomade may be colored red by infusing alkanet in the grease; yellow may be obtained by using annatto in the same way; an oil-soluble chlorophyll will give a green color by admixture.

In coloring grease by means of alkanet or annatto it is best to tie the drug up in a piece of coarse cloth, place in a small portion of the grease, heat gently, squeezing well with a rod from time to time; and then adding this strongly colored grease to the remainder. This procedure obviates exposing the entire mass to heat, and neither decantation nor straining is needed.

Brocq's Pomade for Itching.—

Acid phenic	1 part
Acid salicylic	2 parts

Acid tartaric	3 parts
Glycerole of starch	60 to 100 parts

Mix and make a pomade.

White Cosmetique.—

Jasmine pomade	2 ounces
Tuberose pomade	2 ounces
White wax	2 ounces
Refined suet	4 ounces
Rose oil	15 minims

Melt the wax and suet over a water bath, then add the pomades, and finally the otto.

Glycerine and Cucumber Jelly.—

Gelatin	160 to 240 grains
Boric acid	240 grains
Glycerine	6 fluidounces
Water	10 fluidounces

Perfume to suit. The perfume must be one that mixes without opalescence, otherwise it mars the beauty of the preparation. Orange-flower water or rose water could be substituted for the water if desired, or another perfume consisting of

Spirit of vanillin (15 grains per ounce).	2 fluidrachms
Spirit of coumarin (15 grains per ounce)	2 fluidrachms
Spirit of bitter almonds ($\frac{1}{8}$)	8 minims

to the quantities given above would prove agreeable.

Cucumber Pomade.—

Cucumber pomade ..	2 ounces
Powdered white soap.	$\frac{1}{2}$ ounce
Powdered borax	2 drachms
Cherry-laurel water ..	3 ounces
Rectified spirit	3 ounces
Distilled water to make	48 ounces

Rub the pomade with the soap and borax until intimately mixed, then add the distilled water (which may be warmed to blood heat), ounce by ounce, to form a smooth and uniform cream. When 40 ounces of water have been so incorporated, dissolve any essential oils desired as perfume in the spirit, and add the cherry-laurel water, making up to 48 ounces with plain water.

ROUGES AND PAINTS:

Grease Paints.—Theatrical face paints are sold in sticks, and there are many varieties of color. Yellows are obtained with ocher; browns with burnt umber; and blue is made with ultramarine. These colors should in each case be levigated finely along with their own weight

of equal parts of precipitated chalk and oxide of zinc and diluted with the same to the tint required, then made into sticks with mutton suet (or vaseline or paraffine, equal parts) well perfumed. By blending these colors, other tints may thus be obtained.

White Grease Paints.—

I.—Prepared chalk..	4 av. ounces
Zinc oxide.....	4 av. ounces
Bismuth subnitrate.....	4 av. ounces
Asbestos powder..	4 av. ounces
Sweet almond oil, about.....	2½ fluidounces
Camphor.....	40 grains
Oil peppermint..	3 fluidrachms
Essence bouquet extract.....	3 fluidrachms

Sufficient almond oil should be used to form a mass of proper consistence.

II.—Zinc oxide.....	8 parts
Bismuth subnitrate..	8 parts
Aluminum oxychloride.....	8 parts
Almond oil, quantity sufficient, or	5-6 parts.
Perfume, quantity sufficient.	

Mix the zinc, bismuth, and aluminum oxychloride thoroughly; make into a paste with the oil. Any perfume may be added, but that generally used is composed of 1 drachm of essence of bouquet, 12 grains of camphor, and 12 minims of oil of peppermint for every 3½ ounces of paste.

Bright Red.—

Zinc oxide.....	10 parts
Bismuth subnitrate...	10 parts
Aluminum oxychloride.....	10 parts
Almond oil, quantity sufficient.	

Mix the zinc, bismuth, and aluminum salts, and to every 4 ounces of the mixture add 2½ grains of eosine dissolved in a drachm of essence of bouquet, 12 minims of oil of peppermint, and 12 grains of camphor. Make the whole into a paste with almond oil.

Red.—

Cacao butter.....	4 av. ounces
White wax.....	4 av. ounces
Olive oil.....	2 fluidounces
Oil of rose.....	8 drops
Oil of bergamot..	3 drops
Oil of neroli.....	2 drops
Tincture musk...	2 drops
Carmin.....	90 grains
Ammonia water..	3 fluidrachms

Deep, or Bordeaux, Red.—

Zinc oxide.....	30 parts
Bismuth subnitrate...	30 parts
Aluminum oxychloride.....	30 parts
Carmin.....	1 part
Ammonia water.....	5 parts
Essence bouquet.....	3 parts
Peppermint, camphor, etc., quantity sufficient.	

Mix the zinc, bismuth, and aluminum salts. Dissolve the carmin in the ammonia and add solution to the mixture. Add 24 grains of camphor, and 24 minims of oil of peppermint dissolved in the essence bouquet, and make the whole into a paste with oil of sweet almonds.

Vermilion.—

Vermilion.....	18 parts
Tincture of saffron..	12 parts
Orris root, powdered	30 parts
Chalk, precipitated..	120 parts
Zinc oxide.....	120 parts
Camphor.....	2 parts
Essence bouquet....	9 parts
Oil of peppermint...	2 parts
Almond oil, quantity sufficient.	

Mix as before.

Pink.—

Zinc carbonate.....	250 parts
Bismuth subnitrate..	250 parts
Asbestos.....	250 parts
Expressed oil of almonds.....	100 parts
Camphor.....	55 parts
Oil of peppermint..	55 parts
Perfume.....	25 parts
Eosine.....	1 part

Dark Red.—Like the preceding, but colored with a solution of carmin.

Rouge.—

Zinc oxide.....	2½ ounces
Bismuth subnitrate..	2½ ounces
Aluminum plumbate..	2½ ounces
Eosine.....	1 drachm
Essence bouquet....	2 drachms
Camphor.....	6 drachms
Oil of peppermint...	20 minims
Almond oil, quantity sufficient.	

Dissolve the eosine in the essence bouquet, and mix with the camphor and peppermint; add the powder and make into a paste with almond oil.

Black Grease Paints.—

I.—Soot.....	2 av. ounces
Sweet almond oil..	2 fluidounces
Cacao butter.....	6 av. ounces
Perfume, sufficient.	

The soot should be derived from burning camphor and repeatedly washed with alcohol. It should be triturated to a smooth mixture with the oil; then add to the melted cacao butter; add the perfume, and form into sticks.

Brown or other colors may be obtained by adding appropriate pigments, such as finely levigated burned umber, sienna, ochre, jeweler's rouge, etc., to the foregoing base instead of lampblack.

- II.—Best lampblack..... 1 drachm
Cacao butter..... 3 drachms
Olive oil..... 3 drachms
Oil of neroli..... 2 drops

Melt the cacao butter and oil, add the lampblack, and stir constantly as the mixture cools, adding the perfume toward the end.

- III.—Lampblack..... 1 part
Cacao butter..... 6 parts
Oil neroli, sufficient.

Melt the cacao butter and the lampblack, and while cooling make an intimate mixture, adding the perfume toward the last.

- IV.—Lampblack..... 1 part
Expressed oil of almonds..... 1 part
Oil cocoanut..... 1 part
Perfume, sufficient.

Beat the lampblack into a stiff paste with glycerine. Apply with a sponge; if necessary, mix a little water with it when using.

V.—Beat the finest lampblack into a stiff paste with glycerine and apply with a sponge; if necessary, add a little water to the mixture when using. Or you can make a grease paint as follows: Drop black, 2 drachms; almond oil, 2 drachms; cocoanut oil, 6 drachms; oil of lemon, 5 minims; oil of neroli, 1 minim. Mix.

Fatty Face Powders.—These have a small percentage of fat mixed with them in order to make the powder adhere to the skin.

Dissolve 1 drachm anhydrous lanolin in 2 drachms of ether in a mortar. Add 3 drachms of light magnesia. Mix well, dry, and then add the following: French chalk, 2 ounces; powdered starch, 1½ ounces; boric acid, 1 drachm; perfume, a sufficient quantity. A good perfume is coumarin, 2 grains, and attar of rose, 2 minims.

Nose Putty.—I.—Mix 1 ounce wheat flour with 2 drachms of powdered tragacanth and tint with carmine. Take as much of the powder as necessary, knead into a

stiff paste with a little water and apply to the nose, having previously painted it with spirit gum.

II.—White wax, 8 parts; rosin, white, 8 parts; mutton suet, 4 parts; color to suit. Melt together.

Rose Powder.—As a base take 200 parts of powdered iris root, add 600 parts of rose petals, 100 parts of sandalwood, 100 parts of patchouli, 3 parts of oil of geranium, and 2 parts of true rose oil.

Rouge Tablets.—There are two distinct classes of these tablets: those in which the coloring matter is carmine, and those in which the aniline colors are used. The best are those prepared with carmine, or ammonium carminate, to speak more correctly. The following is an excellent formula:

- Ammonium carminate... 10 parts
Talc, in powder..... 25 parts
Dextrin..... 8 parts
Simple syrup, sufficient.
Perfume, to taste, sufficient.

Mix the talc and dextrin and add the perfume, preferably in the shape of an essential oil (attar of rose, synthetic oil of jasmine, or violet, etc.), using 6 to 8 drops to every 4 ounces of other ingredients. Incorporate the ammonium carminate and add just enough simple syrup to make a mass easily rolled out. Cut into tablets of the desired size. The ammonium carminate is made by adding 1 part of carmine to 2½ parts of strong ammonia water. Mix in a vial, cork tightly, and set aside until a solution is formed, shaking occasionally. The ammonium carminate is made by dissolving carmine in ammonia water to saturation.

Rouge Palettes.—To prepare rouge palettes rub up together:

- Carmine..... 9 parts
French chalk..... 50 parts
Almond oil..... 12 parts

Add enough tragacanth mucilage to make the mass adhere and spread the whole evenly on the porcelain palette.

Liquid Rouge.—

- I.—Carmine..... 4 parts
Stronger ammonia water..... 4 parts
Essence of rose.... 16 parts
Rose water to make 500 parts

Mix. A very delightful violet odor, if this is preferred, is obtained by using ionone in place of rose essence. A cheaper preparation may be made as follows:

II.—Eosine.....	1 part
Distilled water.....	20 parts
Glycerine.....	5 parts
Cologne water.....	75 parts
Alcohol.....	100 parts

Mix.

Rub together with 10 parts of almond oil and add sufficient mucilage of tragacanth to make the mass adhere to the porcelain palette.

III.—Carmine.....	1 part
Stronger ammonia water.....	1 part
Attar of rose.....	4 parts
Rose water.....	125 parts

Mix. Any other color may be used in place of rose, violet (ionone), for instance, or heliotrope. A cheaper preparation may be made by substituting eosine for the carmine, as follows:

IV.—Eosine.....	1 part
Distilled water.....	20 parts
Glycerine.....	5 parts
Cologne water.....	75 parts
Alcohol.....	100 parts

Mix.

Peach Tint.—

a.—Buffalo eosine.....	4 drachms
Distilled water.....	16 fluidounces

Mix.

b.—Pure hydrochloric acid.....	2½ drachms
Distilled water.....	64 fluidounces

Mix.

Pour *a* into *b*, shake, and set aside for a few hours; then pour off the clear portion and collect the precipitate on a filter. Wash with the same amount of *b* and immediately throw the precipitate into a glass measure, stirring in with a glass rod sufficient of *b* to measure 16 ounces in all. Pass through a hair sieve to get out any filtering paper. To every 16 ounces add 8 ounces of glycerine.

Theater Rouge.—Base:

Cornstarch.....	4 drachms
Powdered white talcum.....	6 drachms

Mix.

a.—Carminoline.....	10 grains
Base.....	6 drachms
Water.....	4 drachms

Dissolve the carminoline in the water, mix with the base and dry.

b.—Geranium red.....	10 grains
Base.....	6 drachms
Water.....	4 drachms

Mix as above and dry.

SKIN FOOLS.

Wrinkles on the face yield to a wash consisting of 50 parts milk of almonds (made with rose water) and 4 parts aluminum sulphate. Use morning and night.

Rough skin is to be washed constantly in Vichy water. Besides this, rough places are to have the following application twice daily—either a few drops of:

I.—Rose water.....	100 parts
Glycerine.....	25 parts
Tannin.....	½ part

Mix. Or use:

II.—Orange-flower water.....	100 parts
Glycerine.....	10 parts
Borax.....	2 parts

Mix. Sig.: Apply twice daily.

“Beauty Cream.”—This formula gives the skin a beautiful, smooth, and fresh appearance, and, at the same time, serves to protect and preserve it:

Alum, powdered.....	10 grams
Whites of.....	2 eggs
Boric acid.....	3 grams
Tincture of benzoin..	40 drops
Olive oil.....	40 drops
Mucilage of acacia...	5 drops
Rice flour, quantity sufficient.	
Perfume, quantity sufficient.	

Mix the alum and the white of eggs, without any addition of water whatever, in an earthen vessel, and dissolve the alum by the aid of very gentle heat (derived from a lamp, or gaslight, regulated to a very small flame), and constant, even, stirring. This must continue until the aqueous content of the albumen is completely driven off. Care must be taken to avoid coagulation of the albumen (which occurs very easily, as all know). Let the mass obtained in this manner get completely cold, then throw into a Wedgwood mortar, add the boric acid, tincture of benzoin, oil, mucilage (instead of which a solution of fine gelatin may be used), etc., and rub up together, thickening it with the addition of sufficient rice flour to give the desired consistence, and perfuming at will. Instead of olive oil any pure fat, or fatty oil, may be used, even vaseline or glycerine.

Face Bleach or Beautifier.—

Syrupy lactic acid....	40 ounces
Glycerine.....	80 ounces
Distilled water.....	5 gallons

Mix. Gradually add

Tincture of benzoin.. 3 ounces
Color by adding

Carmine No. 40.....	40	grains
Glycerine.....	1	ounce
Ammonia solution....	$\frac{1}{2}$	ounce
Water to.....	3	ounces

Heat this to drive off the ammonia, and mix all. Shake, set aside; then filter, and add

Solution of ionone.... 1 drachm

Add a few drachms of kaolin and filter until bright.

BLACKHEAD REMEDIES.

I.—Lactic acid.....	1	drachm
Boric acid.....	1	drachm
Ceresine.....	1	drachm
Paraffine oil.....	6	drachms
Hydrous wool fat....	$1\frac{1}{2}$	ounces
Castor oil	6	drachms

II.—Unna advises hydrogen dioxide in the treatment of blackheads, his prescription being:

Hydrogen dioxide	20 to 40	parts
Hydrous wool fat..	10	parts
Petrolatum.....	30	parts

III.—Thymol.....	1	part
Boric acid.....	2	parts
Tincture of witch-hazel.....	18	parts
Rose water sufficient to make...	200	parts

Mix. Apply to the face night and morning with a sponge, first washing the face with hot water and castile soap, and drying it with a coarse towel, using force enough to start the dried secretions. An excellent plan is to steam the face by holding it over a basin of hot water, keeping the head covered with a cloth.

IV.—Ichthyol.....	1	drachm
Zinc oxide.....	2	drachms
Starch.....	2	drachms
Petrolatum.....	3	drachms

This paste should be applied at night. The face should first be thoroughly steamed or washed in water as hot as can be comfortably borne. All pustules should then be opened and blackheads emptied with as little violence as possible. After careful drying the paste should be thoroughly rubbed into the affected areas. In the morning, after removing the paste with a bland soap, bathe with cool water and dry with little friction.

HAND CREAMS AND LOTIONS:

Chapped Skin.—

I.—Glycerine	8	parts
Bay rum	4	parts
Ammonia water	4	parts
Rose water	4	parts

Mix the bay rum and glycerine, add the ammonia water, and finally the rose water. It is especially efficacious after shaving.

II.—As glycerine is bad for the skin of many people, here is a recipe which will be found more generally satisfactory as it contains less glycerine: Bay rum, 3 ounces; glycerine, 1 ounce; carbolic acid, $\frac{1}{2}$ drachm (30 drops). Wash the hands well and apply while hands are soft, preferably just before going to bed. Rub in thoroughly. This rarely fails to cure the worst "chaps" in two nights.

III.—A sure remedy for chapped hands consists in keeping them carefully dry and greasing them now and then with an anhydrous fat (not cold cream). The best substances for the purpose are unguentum cereum or oleum olivarium.

If the skin of the hands is already cracked the following preparation will heal it:

Finely ground zinc oxide, 5.0 parts; bismuth oxychloride, 2.0 parts; with fat oil, 12.0 parts; next add glycerine, 5.0 parts; lanolin, 30.0 parts; and scent with rose water, 10.0 parts.

IV.—Wax salve (olive oil 7 parts, and yellow wax 3 parts), or pure olive oil.

Hand-Cleaning Paste.—Cleaning pastes are composed of soap and grit, either with or without some free alkali. Any soap may be used, but a white soap is preferred. Castile soap does not make as firm a paste as soap made from animal fats, and the latter also lather better. For grit, anything may be used, from powdered pumice to fine sand.

A good paste may be made by dissolving soap in the least possible quantity of hot water, and as it cools and sets stirring in the grit. A good formula is:

White soap.....	$2\frac{1}{2}$	pounds
Fine sand.....	1	pound
Water.....	$5\frac{1}{2}$	pints

Lotion for the Hands.—

Boric acid.....	1	drachm
Glycerine.....	6	drachms

Dissolve by heat and mix with

Lanolin.....	6	drachms
Vaseline.....	1	ounce

Add any perfume desired. The borated glycerine should be cooled before mixing it with the lanolin.

Cosmetic Jelly.—

Tragacanth (white ribbon).....	60	grains
Rose water.....	14	ounces

Macerate for two days and strain forcibly through coarse muslin or cheese